REMARKS

Claims 1, 3-6, 8-20 and 24-26 are pending in the application. Claim 1 is amended herein. Favorable reconsideration of the application is respectfully requested.

I. CLAIM AMENDMENTS

Applicants amend claim 1 to delete the feature added in Applicants previous response. Accordingly, no new issues of patentability are raised. Entry of the amendment and favorable reconsideration of the application is respectfully requested.

II. REJECTION OF CLAIMS 1, 3-6, 8-10, 15-17, 19, 20 AND 24 UNDER 35 USC §103(a)

Claims 1, 3-6, 8-10, 15-17, 19, 20 and 24 remain rejected under 35 USC §103(a) based on *Acosta et al.* in view of *Sasaki et al.* Applicants again respectfully request withdrawal of this rejection for at least the following additional reasons.

Regarding claim 1, the Examiner cites *Acosta et al.* as teaching all of the features of claim 1 with the exception of the protrusions having a height which is at least 10% of the thickness of the liquid crystal and the active region of each pixel partially overlapping with at least one of the protrusions. The Examiner admits that such features are not found in *Acosta et al.*

On the other hand, the Examiner contends that *Sasaki et al.* makes up for the deficiencies in *Acosta et al.* Specifically, the Examiner cites *Sasaki et al.* as teaching an active region 22 of a pixel partially overlapping with protrusions 80 having a height which is at least 105 of the thickness of the liquid crystal. The Examiner argues that it would have been obvious to one having ordinary skill in the art to modify the device in *Acosta et al.* to include the protrusions of *Sasaki et al.* The Examiner contends the

motivation would be to suppress aged-based variation of the domains, eliminate overshoot, and prevent darkening to obtain a device with high brightness and response speed. (See, e.g., O.A., pp. 3-4).

Applicants respectfully submit that *Sasaki et al.* actually *teaches away* from the combination proposed by the Examiner, and therefore would *not* have been obvious to one having ordinary skill in the art.

Specifically, *Sasaki et al.* teaches in the Background of the Invention section that in a liquid display apparatus using horizontal alignment layers, it is necessary to carry out cleaning to clean the substrates formed having the alignment layers after rubbing. As a result, the fabrication of the liquid crystal panel having horizontal alignment layers is comparatively troublesome and the substrates may be polluted during the rubbing. (See, e.g., Col. 1, lns. 48-53).

Sasaki et al. teaches the desirability of avoiding the use of horizontal alignment layers in a liquid display apparatus and instead using vertical alignment layers. Specifically, *Sasaki et al.* teaches that a liquid crystal display apparatus using vertical type alignment layers has the advantages that no rubbing is required. The alignment division can be attained by the arrangement of the linearly arranged structures. (See, e.g., Col. 2, lns. 7-19).

Consequently, *Sasaki et al.* teaches the desirability of forming a liquid crystal display apparatus using *vertical type alignment layers* as compared to *horizontal type alignment layers*. On the other hand, *Sasaki et al.* acknowledges that there are drawbacks associated with conventional liquid crystal displays using vertical alignment layers. *Sasaki et al.* states how in a liquid crystal display apparatus that uses vertical alignment layers, there are regions where the alignment of the liquid crystal molecules is unstable. Moreover, there are problems regarding brightness and response speed, which must be improved. (See, e.g., Col. 2, lns. 20-26).

In order to alleviate these drawbacks associated with the use of *vertical alignment layers*, *Sasaki et al.* teaches that it is desirable to provide a liquid crystal display apparatus of a *vertical alignment type* which has improved brightness and response. (See, e.g., Col. 2, lns. 29-32). Specifically, *Sasaki et al.* teaches that alignment control structures are added to the liquid crystal display apparatus having *vertical alignment layers* in order to improve the alignment, brightness and speed. (See, e.g., Col. 2, lns. 33-40).

Accordingly, one cannot overlook the fact that *Sasaki et al.* teaches the desirability of utilizing alignment control structures (protrusions in the context of the present invention) *only* in the context of liquid crystal displays using *vertical alignment layers*.

Acosta et al. describes an optically compensated birefringent (OCB) device which includes upper and lower substrates (1, 1') each provided with an alignment layer (2, 2'). A liquid crystal layer 3 is provided between the substrates and a voltage can be applied across the liquid crystal layer. (See, e.g., Abstract).

Acosta et al. further teaches that when no electric field is applied across the liquid crystal layer, the liquid crystal is in an H-state (homogenous state) and when an electric field greater than a threshold value is applied across the liquid crystal layer, the liquid crystal molecules adopt a V-state (or bend state). The pi-cell is operated by switching the liquid crystal layer between the first, low voltage V-state and the second, higher voltage V-state. (See, e.g., ¶¶ 8 and 9, and Fig. 2).

In particular, the Examiner relies on Fig. 10 of *Acosta et al.* as describing reactive mesogen layers (8, 8') being deposited onto alignment layers (2, 2') as shown in Figs. 9 and 10. A V-state is stable in region B even when no voltage is applied across the liquid crystal layer. When a voltage is applied across the liquid crystal layer, the V-state grows from region B into the adjacent regions A and C. (See, e.g., ¶¶ 73 and 83). As is shown in Fig. 10 of *Acosta et al.*, however, the alignment layers (2, 2') are low tilt, *horizontal alignment layers*.

Therefore, applicants respectfully submit that one having ordinary skill in the art would not have been motivated to modify the device in *Acosta et al.* based on the teachings of *Sasaki et al.* so as to result, albeit arguably, in the invention of claim 1. *Sasaki et al.* teaches a liquid crystal display apparatus seeking to *avoid* the use of horizontal alignment layers. *Sasaki et al.* teaches the desirability of using *vertical alignment layers* and overcoming the shortcomings of the *vertical alignment layers* by including alignment control structures. *Sasaki et al.* does not teach or suggest any desirability whatsoever for utilizing alignment control structures with *horizontal alignment layers* as referred to in *Acosta et al.*

Accordingly, the Examiner has not provided the requisite motivation for combining the teachings of the references to make a *prima facie* case of obviousness. *Sasaki et al.* arguably teaches the desirability of alignment control structures for use with vertical alignment layers. However, *Sasaki et al.* provides no teaching or suggestion that such alignment control structures are desirable for horizontal alignment layers as in *Acosta et al.* Therefore, one having ordinary skill would not be motivated to make the modification proposed by the Examiner.

As stated in MPEP §2143.01(III), [t]he mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination . In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Applicants therefore respectfully request withdrawal of the rejection of claim 1 and the claims dependent therefrom.

III. REJECTIONS OF CLAIMS 11-14, 18, 25 AND 26 UNDER 35 USC §103(a)

Claims 12-14, 25 and 26 stand rejected under 35 USC §103(a) based on *Acosta et al.* in view of *Sasaki et al.*, and further in view of *Funada et al.* Claims 11 and 18 stand rejected under 35 USC §103(a) based on *Acosta et al.* in view of *Sasaki et al.*,

and further in view of *Ulrich et al.* Withdrawal of these rejections is respectfully requested for at least the following reasons.

Claims 11-14, 18, 25 and 26 each depend from claim 1 either directly or indirectly, and can be distinguished over *Acosta et al.* and *Sasaki et al.* for at least the same reasons. Moreover, neither *Ulrich et al.* nor *Funada et al.* makes up for the above-discussed deficiencies in *Acosta et al.* and *Sasaki et al.* Thus, withdrawal of the rejections is respectfully requested.

IV. CONCLUSION

Accordingly, all claims are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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